

REMARKS

Claims 1, 3-7, 9-12 and 15-48 are all the claims pending in the application.

Initially, as pointed out in the previous Amendment filed February 6, 2006, the Examiner has neither returned the form SB/08 submitted with the Information Disclosure Statement of January 20, 2004, nor has the Examiner provided any explanation as to why the documents submitted in the IDS have not been considered. Accordingly, Applicant respectfully requests that the Examiner initial and return the form SB/08 in the next action.

The outstanding grounds of rejection are summarized as follows:

1) Claims 1, 3-7, 10-12, 17-26, 33-40 and 43-45 stand rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly being obvious over Chen (U.S. Patent No. 6,368,233);

2) Claims 24-26, 40 and 46 stand rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ciasullo (U.S. Patent No. 6,739,984).;

3) Claims 1, 3-7, 9-12, 15-23 and 43-44 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kosugi et al. (U.S. Patent No. 6,106,412, hereinafter "Kosugi") in view of Shaw et al. (U.S. Patent No. 5,423,535, hereinafter "Shaw");

4) Claims 27-29, 41 and 47 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly being unpatentable over Peterson (U.S. Patent No. 6,339,869); and

5) Claims 30-32, 42 and 48 stand rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly being unpatentable over Galy (U.S. Patent No. 5,971,867).

For at least the following reasons, the outstanding grounds of rejection are traversed.

Claim Rejections - 35 U.S.C. § 102/103

A. Chen - Claims 1, 3-7, 10-12, 17-26, 33-40 and 43-45

As noted above, claims 1, 3-7, 10-12, 17-26, 33-40 and 43-45 stand rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by, or, alternatively, under 35 U.S.C. § 103(a) as allegedly being unpatentable over Chen. Applicant respectfully traverses and submits that the rejection of these claims is improper because Chen fails to anticipate all the features of these claims and the Examiner has failed to establish that the features that are deficient in Chen would have been *prima facie* obvious.

In this regard, Applicant notes that the instant Response is filed concurrently with a Declaration Under 37 C.F.R. § 1.132 (hereinafter "Declaration"), which presents the observations of Mr. Masafumi Nishitani, an employee of Bridgestone Sports Co. responsible for development and protection of golf equipment technology. The Declaration is referenced in the discussion that follows.

Independent claim 1

Claim 1 defines a golf club of wood-type having a hollow head body, comprising, *inter alia*, a shaft, and a metal head attached to the shaft, wherein the metal head comprises a body

having an opening in which a striking face member is disposed, the striking face member including a plurality of metal pieces. Claim 1 further recites the features of the plurality of metal pieces are fixed together by laser welding and press forming is performed on the plurality of metal pieces that are fixed together to form a curved surface portion of the striking face member.

Chen does not disclose a plurality of metal pieces fixed by laser welding, nor does Chen suggest a structure in which press forming has been performed on the plurality of metal pieces that are fixed together by laser welding to form a curved surface portion of the striking face member. Indeed, in the Office Action, the Examiner improperly contends, without support, that these features do not impart structural limitation. For instance, the Examiner alleges as follows:

“Regarding claims 1, 4, 6-7, 10, 12, 17-26, and 33-36, Chen discloses a wood-type golf club head having a hollow head body comprising: a shaft (not shown but inherent feature of a golf club); and a striking face 62 including a plurality of metal pieces (main piece 62 of titanium and arcuate piece 64 of stainless steel); a crown member 30 including a plurality of pieces (main piece 32 titanium and annular piece 34 stainless steel)]. The recitation with respect to ‘laser welding, press forming, plastic working, and formed by applying post-machining’ is directed to the method of production, which does not impart structural limitation to the claimed apparatus. Note, the patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See *In re Whorpe* [sic], 777 F.2d 695, 698, 277 USPQ 964, 966 (Fed. Cir. 1985) and *In re Fessman*,

489 F.2d 742, 744, 180 USPQ 324 (CCPA 1974). See MPEP
2113.”

See Office Action at page 3 (emphasis original).

a. The striking face of Chen is a single piece formed of a single material, not a striking face including a plurality of metal pieces, as claimed.

Initially, Applicant disagrees with the Examiner’s characterization of main piece 62 and arcuate piece 64 of Chen as corresponding to the claimed striking face. For instance, as shown in Figures 8 and 9 of Chen, the main piece 62 of the golf club head includes recesses for contact with a golf ball. See Chen at col. 2, lines 58-64. However, arcuate piece 64 is provided at the periphery of the actual striking surface, and merely provides a transition between the striking face provided by main piece 62 and the main body 50.

The Examiner has failed to provide any supporting rationale for the alleged interpretation of a transitional arcuate piece, which is never described by Chen as being any part of a striking face, as a piece of the striking face itself. Indeed, as is evident from Figures 8 and 9 of Chen, arcuate piece 64 is clearly not provided in a region intended to strike a golf ball. Rather, the arcuate piece, which is shown separate from the main piece having grooves for contact, i.e., striking, a golf ball, simply provides transition between the striking face and the main body.

Indeed, as discussed in the previous Amendment, Applicant pointed out that Chen teaches a striking face having a single piece formed of a single material (i.e., titanium), and further noted that, as evidenced by the formation of the grooves solely on the main piece 62, the arcuate piece is not a “striking face”. Applicant therefore argued that Chen fails to teach or

suggest a striking face, as claimed, which includes a plurality of metal pieces. *See* Amendment filed February 6, 2006 at pages 14-15.

However, in the present Office Action, the Examiner has not addressed the above arguments with respect to Chen teaching a single piece striking face. Applicant again submits that the Examiner's interpretation of Chen is improper for at least the foregoing reasons, which are reiterated in the present Response. As stated in MPEP § 707.07(f), "[w]here the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it."

b. Chen further does not suggest a laser welded structure in which press-forming is subsequently performed on a plurality of metal pieces fixed together by laser welding, as defined by claim 1, and therefore fails to anticipate all the claim limitations.

In the Office Action, the Examiner again fails to give proper consideration to the limitation of "wherein said plurality of metal pieces are fixed together by laser welding and press forming is performed on the plurality of metal pieces that are fixed together to form a curved surface portion of the striking face member." For instance, as noted in the previous Amendment, Chen does not suggest that laser welding is performed, as claimed, and further fails to teach that press forming is performed on any laser welded pieces of a striking face member. *See* Amendment filed February 6, 2006 at pages 15-17.

Rather, Applicant pointed out that Chen suggests that the pieces of the golf club head are simply "welded" together by conventional welding. Conversely, laser welding and press

forming, as claimed, provides a product with distinct structural features which differ from conventionally welded pieces as in Chen. Thus, Chen does not anticipate all the features of claim 1, and the Examiner had failed to provide any objective evidence that modifying the conventionally welded structure of Chen to provide laser welding followed by press forming of plural pieces of a striking face member would have been *prima facie* obvious.

In response to the previous arguments, the Examiner alleges that Chen discloses all the "structural" features of claim 1. However, as evidenced at least by the 132 Declaration filed concurrently herewith, this assertion is inaccurate because a laser welded structure is in fact structurally distinct from a conventionally welded structure. For instance, as set forth in the Declaration, gaps between pieces are necessary for conventionally welding cast or press formed pieces, while gaps are not present when high energy laser welding is used. *See* Declaration at pages 2-3.

In more detail, the Declaration describes that gaps between members to be welded typically result from prior casting and/or press forming processes. In order to compensate for these gaps, a welding rod is used to fill the gap in a conventional welding process. The addition of the welding rod to fill the gap increases the weight of the resulting structure to more than the sum of the unwelded pieces. *See* Declaration at pages 3-4. The added weight resulting from the welding rod results in unavoidable manufacturing variations, since the weight of the bead part cannot be controlled. *See* Declaration at page 5.

Conversely, in a laser welded structure, no welding rod is used. Rather, both materials are butted, and only the butted materials are melted and welded. As a result, the weight of the

resulting welded structure is the same as the combined weight of the pieces prior to welding. Also, as noted in the Declaration, if there is a gap existing between metals to be welded, it may be impossible to weld with laser welding, since no welding rod is used to fill the gap. *See* Declaration at page 4.

Moreover, conventional welding imparts structural changes in the welding region quite different from laser welding. As discussed in the Declaration, energy is concentrated at the weld joint with laser welding, and heating of the surrounding structure is not necessary. Rather, the high energy of laser welding allows for localized melting of the pieces to be welded such that the heat effect on the surrounding structure is small. Conventional welding, though, results in melting of both the welding rod and a region of the pieces to be welded, such that the gap between the pieces is filled with the melted welding rod. *See* Declaration at page 4.

Conventional welding further results in a "surface sink" that forms by the contraction of the welding rod material upon cooling. Laser welding, however, does not result in such a bead because the weld is formed by localized heating of the metal pieces at the joint region. *See* Declaration at page 5.

Still further, the increased heat exposure to a greater area surrounding the joint region in the case of conventional welding produces structural changes that are not found in laser welding. Indeed, a large region of a conventionally welded structure may become brittle, which results in a comparatively weaker structure than laser welding. *See* Declaration at page 5.

Laser welding, however, with heat energy precisely applied to a localized focused at the joint, results in the metal surrounding the joint being exposed to lower levels of heat, providing a

welded structure differing on a structural level by virtue of less severe exposure to heat. Further, a smooth, uninterrupted outer common surface can be obtained from laser welding, which is then suitable for post-machining, to provide a more durable structure due to more focused exposure of heat to the joint region. *See Declaration at page 6.*

On the other hand, conventional welding provides welded pieces that differ structurally due to additional weight from the welding rod, gaps between the respective pieces of a compound surface that must be filled by the welding rod. Further, the exposure of heat to a greater region surrounding the weld with conventional welding provides a resulting structure that is comparatively weaker than a laser welded structure, as claimed. *See Declaration at page 6.*

For a prior art reference to anticipate a claim, the reference must disclose *each and every element* of the claim with *sufficient clarity* to prove its existence in the prior art. Motorola, Inc. v. Interdigital Tech. Corp., 121 F.3d 1461, 1473 (Fed. Cir. 1997); *see also* Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1989), *cert. denied*, 493 U.S. 853 (1989); Azko N.V. v. United States Int'l Trade Comm'n, 808 F.2d 1471, 1479 (Fed. Cir. 1986), *cert. denied*, 482 U.S. 909 (1987). Although the disclosure requirement “presupposes the knowledge of one skilled in the art of the claimed invention, that presumed knowledge does not grant a license to read into the prior art reference teachings that are not there.” Motorola, 121 F.3d at 1461.

Moreover, “anticipation is not shown by a prior art disclosure which is only ‘substantially the same’ as the claimed invention.” Jamesbury Corp. v. Litton Indus. Products, Inc., 756 F.2d 1556, 1560 (Fed. Cir. 1985). Rather, the exclusion of a claimed element from a prior art

reference is enough to negate anticipation by that reference. See Atlas Powder Co. v. E.I. du Pont de Nemours & Co., 750 F.2d 1569, 1574 (Fed. Cir. 1984).

As evidenced by the foregoing, numerous *structural differences* exist between a conventionally welded golf club structure, and a golf club head in which a plurality of pieces of the striking face member are laser welded and press formed is performed on the plurality of metal pieces that are fixed by laser welding, as claimed. Thus, the Examiner's assertion that these features do not impart structural limitation, as alleged at page 10 of the Office Action, is incorrect, and Chen cannot anticipate the combination of features defined by claim 1.

c. Product-by-process limitations must be given patentable weight, to the extent that a distinct and non-obvious structure is defined.

As discussed below, Applicant respectfully disagrees with the Examiner's reliance on In re Thorpe and In re Fessman. Product-by-process claims allow inventors to claim "an otherwise patentable product that resists definition by other than the process by which it is made." Smithkline Beecham Corp. v. Apotex Corp., 439 F.3d 1312, 1315 (quoting Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 158 (1989)). Further, although a rule of necessity regarding the description of a product and the process by which it is made previously applied, the use of product-by-process claims even where the invention could have been described independent of the process has clearly been endorsed. See Smithkline, 439 F.3d at 1315.

However, neither In re Thorpe nor In re Fessman stand for the proposition that product-by-process limitations can be ignored by conclusory allegations of equivalent structure or

obvious differences in spite of the structural distinctions noted above and the insufficient motivation to modify discussed below. As previously discussed, the Federal Circuit held in In re Thorpe that the determination of patentability in "product-by-process" claims is *based on the product itself*, even though such claims are limited and defined by process. Thus the product in such claims is unpatentable only if it is the same as, or obvious from, a product of prior art, even if the prior product was made by a different process. See Response filed April 14, 2005 at pages 6-8.

Product-by-process limitations therefore must be given appropriate patentable weight, to the extent these limitations define a distinct product. See Response filed April 14, 2005 at pages 6-7. As numerous structural differences between Chen and the claimed golf club have been set forth above, the deficiencies of the asserted motivation to modify will be discussed in the following.

d. The Examiner has failed to provide a sufficient motivation to modify the disclosure of Chen.

In the grounds of rejection, the Examiner fails to set forth any motivation to modify the actual disclosure of Chen, which, as discussed above, fails to anticipate all the claim limitations. Further, in the Response to Arguments, the Examiner simply asserts, without support, that "there is nothing unobvious about laser welding club parts together over conventional welding techniques since laser welding is more precise and has less heat effecting area, which minimizes corrosion and cracking." See Office Action at pages 10-11.

Applicant submits that such an assertion, which is the conclusory opinion of the Examiner without objective evidence of the alleged motivation to modify the actual disclosure of Chen, is insufficient to establish *prima facie* obviousness. Moreover, the asserted motivation does not even address the further feature of the press forming performed on the plurality of metal pieces that are fixed together by laser welding to form a curved surface portion of the striking face member, as claimed. Rather, the only semblance of an alleged motivation is directed to conclusory statements regarding laser welding versus conventional welding.

Deficiencies of cited references cannot be remedied by “general conclusions about what is ‘basic knowledge’ or ‘common sense.’” In re Zurko, 59 U.S.P.Q.2d 1694, 1697 (Fed. Cir. 2001); *see also* In re Lee, 61 U.S.P.Q.2d 1430, 1433 (Fed. Cir. 2002). Further, as explained in M.P.E.P. § 2144.03, “[i]t is never appropriate to rely solely on ‘common knowledge’ in the art without evidentiary support in the record, as the principal evidence upon which a rejection was based.”

In rejections under 35 U.S.C. § 103, the inquiry is “whether a person of ordinary skill in the art, possessed with the understandings and knowledge reflected in the prior art, and motivated by the general problem facing the inventor, would have been led to make the combination recited in the claims.” In re Kahn, 441 F.3d 977, 988 (Fed. Cir. 2006). Unsubstantiated speculation is not a substitute for objective evidence of a motivation to modify. Indeed, “rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” In re Kahn, 441 F.3d at 987-88 (quoting In re Kotzab, 217

F.3d 1365, 1370 (Fed. Cir. 2000)). The showing of a suggestion or motivation to modify a reference is likewise applicable when only one reference is relied upon. See In re Kotzab, 217 F.3d at 1370 (“Even when obviousness is based on a single prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference.”).

Further, the USPTO is held to a rigorous standard when trying to show that an invention would have been obvious in view of the combination of two or more references or modification of a single reference. See In re Lee, 277 F.3d 1338, 1343 (Fed. Cir. 2002), citing, e.g., In re Dembiczak, 175 F.3d 994, 999 (Fed. Cir. 1999) (“Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references.”); see also Alza Corp. v. Mylan Lab., Inc., 2006 U.S. App. LEXIS 22616 at *7 (Fed. Cir. 2006) (“At its core, our anti-hindsight jurisprudence is a test that rests on the unremarkable premise that legal determinations of obviousness, as with such determinations generally, should be based on evidence rather than mere speculation or conjecture.”).

The case law emphasizes that the “need for specificity pervades this authority.” In re Lee 277 F.3d at 1433 (citing In re Kotzab, 217 F.3d 1365, 1371 (Fed. Cir. 2000) (“particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed”). However, in alleging that the features of claim 1 would have been obvious in view of Chen, the Examiner has both failed to address all the deficient features, such as the claimed press forming of the laser welded pieces, and fails to provide any evidentiary support for the assertion that

modifying the actual disclosure of Chen in such a manner as to arrive at the claimed combination would have been obvious.

Thus, the rejection of claim 1 based on the Examiner's alternative contention under 35 U.S.C. § 103 is improper because the Examiner has not established *prima facie* obviousness, but has instead impermissibly relied upon hindsight reconstruction. Further, Applicant submits that dependent claims 3-6, 15, 17, 19-20, 23, 33-34, 37 and 43 are allowable at least by virtue of their dependency.

Independent claim 7

Claim 7 defines a golf club of wood-type having a hollow head body comprising, *inter alia*, a shaft, and a metal head attached to the shaft, wherein the metal head comprises a body having an opening in which a striking face member is disposed, the striking face member includes a portion formed through plastic working of a compounded metal plate fabricated through joining a plurality of metal pieces made of forged or rolled material by laser welding. Claim 7 further recites the feature of the compounded metal plate is fabricated by fixing together by laser welding the metal pieces so that the metal pieces appear on an outside common surface of the striking face member of the head and the plastic working is performed on the compounded metal to form a curved surface portion of the striking face member.

For reasons analogous to those set forth above with respect to claim 1, Applicant submits that Chen does not anticipate at least the features of joining a plurality of metal pieces made of forged or rolled material by laser welding and the compounded metal plate being fabricated by

fixing together by laser welding the metal pieces so that the metal pieces appear on an outside common surface of the striking face member of the head and the plastic working is performed on the compounded metal to form a curved surface portion of the striking face member, as claimed. The Examiner has likewise failed to establish *prima facie* obviousness with respect to at least these features. Thus, the rejection of claim 7 is improper, and reconsideration and withdrawal of this ground of rejection is requested. Further, Applicant submits that dependent claims 9-12, 16, 18, 38 and 44 are allowable at least by virtue of their dependence and by virtue of the features recited therein.

Independent claim 21

Claim 21 defines a golf club of wood-type having a hollow head body, comprising, *inter alia*, a shaft, and a metal head attached to the shaft, wherein the metal head comprises a plurality of metal pieces. As further recited, the plurality of metal pieces are on an *outside common surface* of the head and are fixed together by welding, the welding process resulting in a smooth continuous outside common surface, wherein press forming is performed on the plurality of metal pieces that are fixed together by laser welding to form a curved surface of the outside common surface of the head.

At least for the reasons analogous to those discussed under sections b) - d) with respect to the rejection of claim 1, Applicant submits that the rejection of claim 21 is improper because Chen neither anticipates all the claimed features, nor has the Examiner established *prima facie*

obviousness. Further, Applicant submits that claims 22, 35-36, 39 and 45 are allowable at least by virtue of their dependency and by virtue of the features recited therein.

Independent claim 24

Claim 24 defines a golf club of wood-type having a hollow head body, comprising, *inter alia*, a shaft, and a metal head attached to the shaft, wherein the metal head comprises a body having an opening in which a crown member is disposed, the crown member including a plurality of metal pieces. As further recited, the metal pieces appear on *an outside surface of the crown member* and are fixed together by laser welding and press forming is performed on the plurality of metal pieces that are fixed together to form a curved surface portion of the crown member.

At least for the reasons analogous to those discussed under sections b-d with respect to the rejection of claim 1, Applicant submits that the rejection of claim 24 is improper because Chen neither anticipates all the claimed features, nor has the Examiner established *prima facie* obviousness. Further, Applicant submits that claims 25-26, 40 and 46 are allowable at least by virtue of their dependency and by virtue of the features recited therein.

Dependent claims 43-46

Dependent claims 43-46 respectively depend from claims 1, 7, 21 and 24, and recite the plurality of metal pieces have the same thickness. Applicant respectfully submits that Chen fails to suggest the features of these claims. For instance, claim 43 depends from claim 1 and defines

the plurality of metal pieces of the striking face member have the same thickness. As discussed above, however, Chen does not suggest a striking face member including a plurality of pieces, as claimed. Thus, Chen necessarily does not suggest plural pieces having the same thickness, as claimed.

For analogous reasons, Applicant submits that the rejection of claims 44-46 is additionally improper because Chen fails to teach the respective plurality of pieces defined by independent claims 7, 21 and 24, as having the same thickness. Accordingly, Applicant submits that dependent claims 43-46 are also allowable for these reasons.

B. Ciasullo - Claims 24-26, 40 and 46

As noted above, Claims 24-26, 40 and 46 stand rejected under 35 U.S.C. § as allegedly being anticipated by, or alternatively, under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ciasullo. Applicant respectfully traverses and submits that Ciasullo neither anticipates all the claimed features, nor has the Examiner established *prima facie* obviousness.

Independent claim 24

For instance, Ciasullo does not disclose at least the feature of the metal pieces appear on *an outside surface of the crown member* and are fixed together by laser welding and press forming is performed on the plurality of metal pieces that are fixed together to form a curved surface portion of the crown member, as claimed. Indeed, in the grounds of rejection, the

Examiner again fails to give proper patentable weight to all the claim limitations. In particular, the Examiner alleges as follows:

“Ciasullo discloses a wood-type golf-club head having a hollow head body comprising: a shaft (not shown but inherent feature of a golf club); a crown member 30 including a plurality of metal pieces (18, 22) [*sic*] are welded together to form a curved portion of the crown member (Col. 5, lines 15-24). The recitation with respect to “laser welding, press forming, forged, and rolled” is directed to the method of production, which does not impart structural limitation to the claimed apparatus. Note, the patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See *In re Whorpe* [*sic*], 777 F.2d 695, 698, 277 USPQ 964, 966 (Fed. Cir. 1985) and *In re Fessman*, 489 F.2d 742, 744, 180 USPQ 324 (CCPA 1974). See MPEP 2113.”

See Office Action at pages 4-5 (emphasis original).

Ciasullo, however, teaches a golf club head in which the top plate 16 (e.g., crown) and the sole plate 12 respectively include inner and outer shells that are bonded together by explosion welding. Specifically, sole plate member 12 includes a titanium inner shell 32 that is bound to stainless steel outer shell 26 by explosion welding. See Ciasullo at col. 3, lines 35-46. The top plate 16 includes a forward top plate member 18 and rear top plate member 22, wherein the rear top plate member comprises an outer shell 34 formed from stainless steel, which is similarly bonded to a titanium inner shell 40 by explosion welding. See Ciasullo at col. 3, line 56 - col. 4,

line 9. Ciasullo teaches that incorporating “substantial quantities” of stainless steel in the sole plate member 12 and the rearward top plate member 22 moves the center of gravity of the golf club head downwardly and rearwardly to “improve the striking characteristics of the golf club head”. See Ciasullo at col. 4, lines 42-65.

The manner in which the golf clubs of Ciasullo are manufactured, which is directed to, explosion welding, simply does not suggest the feature of “wherein the metal pieces appear on an outside surface of the crown member and are fixed together by laser welding and press forming is performed on the plurality of metal pieces that are fixed together to form a curved surface portion of the crown member”, as recited by independent claim 24. For instance, Ciasullo clearly teaches that the pieces of the golf club that are bonded by explosion welding (i.e., the sole pate and rearward top plate member) are cut from the titanium/stainless steel bonded sheet, the remaining parts are cut from standard titanium sheets, and the pieces are forged into their desired shapes, spot welded in place, and then welded in an argon gas chamber. Thus, contrary to the process limitations of claim 24, Ciasullo teaches that forging is performed *prior to welding* of the pieces of the crown (i.e., forward top plate member 18 and rearward top plate member 22), which is plainly inconsistent with the claim features.

Moreover, Ciasullo likewise fails to suggest laser welding of the plurality of metal pieces of the crown member. Rather, as discussed above, Ciasullo teaches that titanium and stainless steel are bonded by explosion welding to form rearward top plate member 22, and the rearward top plate member 22 is spot welded to the forward top plate member 18 after the forging process,

and the pieces of the club are welded in an argon gas chamber, which is followed by grinding and polishing steps. *See* Ciasullo at col. 5, lines 21-25.

As discussed in greater detail in the concurrently filed 132 Declaration, explosion welding, as described in Ciasullo, is a technique for joining a metal piece to another metal piece which lies over it. However, explosion welding is different from conventional welding since neither the base material nor the cladding melts as in conventional welding. Rather, in explosion welding, metal in the vicinity of a collision point exhibits floating behavior such that the metal around the bonded interface of overlying pieces is strongly plastic-deformed and then jointed. Further, the interface of the explosion welded pieces has a wave shape. *See* Declaration at pages 6-7.

Consequently, explosion welding cannot be applied to a butt joint. Explosion welding is therefore not suitable for welding end faces, such as in plural metal pieces on an outside surface of a golf club. Conversely, laser welding is a fusion welding method utilizing a laser beam as a heat source. Since a laser has a large light focusing property, the laser beam can be used as a strongly concentrated heat source having a large energy density. Also, in material processing involving laser welding, the effect of heat to the welded materials is smaller than conventional welding. The deformation of welded materials is therefore less than in explosion welding, or the conventional welding with a welding rod for reasons discussed above. *See* Declaration at page 7.

Moreover, as pointed out previously, Ciasullo teaches that after the explosion welding of the overlapping pieces is performed, the overlapping pieces are shaped or forged, *then* welded. The structure of a surface member of a wood golf club including multiple metal pieces that are

forged (i.e., shaped) prior to welding by conventional means is structurally distinct from a laser welded structure followed by press forming, as discussed above. *See* Declaration at pages 7-8.

Thus, the laser welding of plural pieces of the crown member, followed by press forming of the laser welded pieces, is structurally distinct from the golf club of Ciasullo for the reasons discussed above. Further, the Examiner has failed to provide any objective evidence that modifying Ciasullo to use laser welding followed by press forming would have been obvious. Accordingly, as Ciasullo neither anticipates all the features of claim 24, nor has the Examiner established *prima facie* obviousness, the rejection of claim 24 is improper. With respect to claims 25-26, 40 and 46, Applicant submits that these claims are allowable at least by virtue of their dependency and by virtue of the features recited therein.

Additional arguments for patentability of claims 40 and 46 are presented below.

Dependent claim 40

Also with respect to dependent claim 40, which recites that laser welding is performed in the same plane on the plurality of metal pieces, which are fixed together by the laser welding as flat surfaces prior to the press forming, Applicant submits that the Examiner has given proper weight to these features. Indeed, Ciasullo plainly teaches the opposite of the claim limitation. As previously noted, Ciasullo teaches that forging is performed prior to welding, which is plainly inconsistent with laser welding in the same plane, followed by press forming. Thus, the rejection of claim 40 is also improper for at least these reasons.

Dependent claim 46

With respect to claim 46, Applicant disagrees with the Examiner's contention that it would have been "obvious to select metal pieces having the same thickness." *See* Office Action at page 5. In support of this position, the Examiner asserts "Ciasullo appears to show the metal pieces have the same thicknesses" and "the court held that a change in size is within the level [of] ordinary skill in the art."

This contention is conclusory, as the Examiner has provided no objective evidence of any motivation to modify the actual disclosure of Ciasullo, and insufficient to establish *prima facie* obvious for reasons analogous to those discussed above with respect to claim 1. For instance, the stainless steel/titanium bonded rearward top plate member 22 is clearly shown as having a different thickness than the forward top plate member 18. *See* Ciasullo at Fig. 2.

Moreover, the plurality of metal pieces having the same thickness is not simply a change in size and the Examiner has failed to provide any evidence that modifying the different thicknesses of the rearward top plate member, in which stainless and titanium are bonded by explosion welding, to have the same thickness of the forward top plate member would be desirable. Indeed, Ciasullo teaches away from metal pieces having the same thickness because the purpose of the increased thickness of the rearward top plate member is to shift the center of gravity of the club downwardly and rearwardly. The rejection of claim 46 is therefore improper for these additional reasons.

C. Peterson - Claims 27-29, 41 and 47

Claims 27-29, 41 and 47 stand rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as allegedly being unpatentable over Peterson. Applicant respectfully traverses and submits that Peterson neither anticipates all the claimed features, nor has the Examiner established *prima facie* obviousness.

For instance, as discussed in the Amendment of February 6, 2006, Applicant submits that Peterson fails to suggest *at least* the feature of the metal pieces being fixed together by laser welding and the press forming performed on the plurality of metal pieces that are fixed together to form a curved surface portion of the side wall member, as claimed. As with the rejections based on Chen, the Examiner does not give proper weight to the product-by-process limitations. The golf club of claim 27 is structurally distinct from Peterson because Peterson does not teach laser welding of a plurality of metal pieces on an outside surface of a side wall member, and press forming performed on the plurality of metal pieces fixed together to form the curved surface portion. Rather, the conventional welding of Peterson is similar to that discussed with respect to Chen, and thus, the above arguments regarding structural differences resulting from laser welding and press forming are likewise applicable.

Further, Applicant submits that Peterson's teaching of either casting from the same material or separately constructing the detachable cap 36, which is attached to skirt 30, is inconsistent with the claimed laser welding of the plurality of metal pieces and then press forming the metal pieces that are fixed by laser welding to form a curved surface portion. *See* Amendment of February 6, 2006 at page 19. Indeed, as taught by Peterson, in order for the cap

to be produced of a different material, then the cap would be separately constructed and then welded.

Moreover, the Examiner, as with the rejections based on Chen, has failed to provide a sufficient motivation to modify the actual disclosure of Peterson so as to arrive at the claimed combination. Thus, the above arguments set forth in section d) of the discussion of Chen are equally applicable to the instant grounds of rejection. Applicant submits that the Examiner has again relied upon impermissible hindsight reconstruction based on knowledge gleaned solely from Applicant's disclosure.

Accordingly, as Peterson neither anticipates all the features of claim 27, nor has the Examiner established *prima facie* obviousness, Applicant submits that the rejection of claim 27 is improper, and reconsideration and withdrawal are requested. With respect to dependent claims 28-29, 41 and 47, Applicant submits that these claims are allowable at least by virtue of their dependency, and by virtue of the features recited therein.

D. Galy - Claims 30-32, 42 and 48

Independent claim 30 defines a golf club comprising a sole member which includes a plurality of metal pieces, wherein the metal pieces appear on an outside surface of the sole member and are fixed together by laser welding and press forming is performed on the plurality of metal pieces that are fixed together to form a curved surface portion of the sole member. Applicant respectfully traverses the rejection of claim 30 and submits that Galy fails to anticipate

all the claimed features, at least because the structure defined by these claims is not disclosed by Galy, and the Examiner has failed to establish *prima facie* obviousness.

For instance, Galy neither teaches that metal pieces are fixed together by laser welding, nor does Galy teach that press forming is performed on the plurality of metal pieces that are fixed together to form a curved surface portion, as claimed. Indeed, Galy teaches that an arc-shaped portion 32 is *separately formed* and then attached to the sole plate 11. See Galy at col. 4, lines 42-59. However, there is no suggestion that the arc shaped portion is laser welded, as claimed, and press forming is then performed on the laser welded structure.

Thus, Applicant submits that the structure of claim 30, which requires laser welding of the plurality of pieces of the sole member, followed by press forming, is structurally distinct from the separately formed pieces of Galy which are attached after being formed. Also, Applicant submits that the Examiner has failed to establish that modifying Galy so as to provide a laser welded and press formed structure would have been *prima facie* obvious, at least for reasons analogous to those discussed above with respect to Chen.

Reconsideration and withdrawal of the rejection of claim 30 is requested. With respect to claims 31, 32, 42 and 48, Applicant submits that these claims are allowable at least by virtue of their dependency and by virtue of the features recited therein.

Claim Rejections - 35 U.S.C. § 103

E. Kosugi in view of Shaw - Claims 1, 3-7, 9-12, 15-23, and 43-44

Claims 1, 3-7, 9-12, 15-23, and 43-44 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kosugi in view of Shaw. Applicant traverses and submits that this ground of rejection is improper at least because the combination of Kosugi and Shaw fails to teach all the claimed features and the asserted motivation to combine is impermissibly premised on hindsight reconstruction.

For instance, in rejecting independent claim 1, the Examiner alleges as follows:

“Regarding claims 1, 7, and 15-23, Kosugi et al. discloses a golf [sic] hollow golf club head (Fig. 1) comprising: a shaft (S) and a metal head (1) attached to the shaft, wherein the metal head comprises a body (22,23) having an opening in which a striking face member (21), wherein the face member 21 is [sic] press forming, forging, and plastic working (Col. 3, lines 25-30) from a rolled material to form a smooth, curved surface portion (Fig. 2) of the striking face member (21) and the body parts (21,22,23) are welded to form an integral unit (Col. 2, lines 60-64).”

See Office Action 5-6.

As conceded by the Examiner, Kosugi does not disclose a striking face member made from a plurality of metal pieces fixed together by laser welding. However, the Examiner further contends:

“Kosugi et al. fails to disclose the striking face member is made from a plurality of metal pieces [sic] are fixed together by laser welding. Shaw teaches a metal face plate (Col. 2, lines 13-

20) can be made of one or more component(s) (Col. 1, lines 42-58 and Figs. 23-26), which are welded together (Col. 4, lines 23-29). Such multi-piece face component(s) provide a golf club with different properties such as weight distribution, friction, spin rates, flexural modulus, resilience, and hardness, and aesthetic appearance (Col. 2, lines 13-17, Col. 2, lines 39-43), [sic] Col. 3, lines 35-45). Thus, it would have been obvious in view of Shaw to one having ordinary skill in the art to modify the striking face member of Kosugi with a face member with a plurality of pieces as taught by Shaw to gain the above benefits.”

See Office Action at page 6.

Applicant disagrees with the Examiner’s contention that the features of these claims would have been *prima facie* obvious in view of the combination of Kosugi and Shaw. As discussed below, the Examiner again fails to give proper weight to the process limitations regarding laser welding and press forming/plastic working of multiple piece surfaces, such as the striking face member of claims 1 and 7 and the outside common surface of claim 21, and the Examiner has impermissibly relied on improper hindsight reasoning as the basis to combine Kosugi and Shaw.

For instance, as presently understood, Kosugi teaches a wood type golf club in which the ball striking shell part 21, top surface shell part 22 (i.e., crown), and peripheral surface shell part 23 (i.e., sole) are each formed as separate single piece members and welded together to form an integral ball-striking member 20. See Kosugi at col. 45-64 and Figs. 1 and 2. Further Kosugi teaches that shaft insertion member 30 of hosel 3 is has microscopic pores such that the density of the shaft insertion member is lower than ball striking member 20, which provides improved

ball striking characteristics by varying the relative densities between the ball striking member and the shaft insertion member. *See* Kosugi at col. 3, lines 57 - col. 4, line 9.

As conceded by the Examiner, Kosugi does not suggest a striking face member comprised of a plurality of metal pieces. Rather, as noted above, the striking shell part is taught as being a single piece structure. To compensate for this deficiency, the Examiner again relies on Shaw. However, the combination of Kosugi and Shaw is improper and fails to teach or suggest all the features of these claims.

Rather, as discussed in the previous Amendment, Shaw does not disclose any embodiments other than iron-type golf clubs. The reference does not mention putters, nor does the reference mention wood-type golf clubs. The actual scope of the teaching of Shaw is clearly evidenced by the disclosure of the reference itself. Shaw explicitly states, "An object of the present invention is to improve the performance characteristics of *golf irons*." *See* Shaw at col. 1, lines 18-20.

As discussed in the concurrently filed 132 Declaration, *significant* differences both in structure and design considerations exist between iron golf clubs and wood golf clubs. Thus, the structure of a iron golf club cannot simply be interchanged with a wood golf club. *See* Declaration at page 8.

For instance, an iron golf club does not have shell pieces that define a hollow cavity, as in the hollow inner structure of a wood golf club. Also, the face-plate thickness of an iron is much thicker than a face plate of a wood golf club due to the increased weight of an iron club and the different shape. Further, since the force on the iron is small when the golf ball is hit, the face of

the iron is unlikely to deform. Thus, as disclosed by Shaw at column 4, lines 23-29, it is possible to use all sorts of bonding. *See Declaration at page 8.*

By contrast, the thickness of a wood golf club striking face is much thinner. Further, since the force on the wood is relatively large when the ball is hit, the face of the wood is likely to undergo deformation. As a result, a strong welding method is important in wood golf clubs. However, since the face is thin, it is difficult to perform ordinary bonding. Thus, the characteristics and constraints of wood golf club and iron golf club designs differ significantly and the structure of an iron golf club striking face cannot readily be applied to a wood golf club. *See Declaration at page 8.*

Further, Shaw's welding of an iron golf club head necessarily involves a back portion which is not present in a wood golf club, such as Kosugi. *See Shaw at Figs. 29 and 32.* The Examiner's rejection wholly fails to establish how the teaching of an iron type striking face could be modified to be applied to a wood golf club head.

Moreover, Applicant submits the combination is improper because Kosugi teaches away from the claimed invention. As noted above, Kosugi teaches that the striking face member, as well as the crown member and sole member, are each *single* piece structures. Again, the Examiner has failed to provide objective evidence that modifying the single piece striking face member of Kosugi based on the teaching of an golf iron striking face would have been obvious.

As with the rejection of claim 1 based on Chen, Applicant submits that the Examiner is similarly not giving proper weight to the recitations of laser welding followed by press forming/plastic working. Thus, the structure of the golf club defined by claim 1 not only

different from the proposed combination of Kosugi and Shaw, but the asserted motivation to combine their disparate teachings is improper, being based on impermissible hindsight reconstruction.

Reconsideration and withdrawal of the rejection of claim 1 is requested. Applicant submits that dependent claims 3-6, 15, 17, 19-20, 23, 33-34, 37 and 43 are allowable at least by virtue of their dependency and by virtue of the features recited therein.

Independent claims 7 and 21

For reasons analogous to those discussed above, Applicant submits that the rejection of independent claims 7 and 21 is improper. Further, Applicant submits that dependent claims 9-12, 16, 18, 22, 36-35, 38-39 and 44-45 are allowable at least by virtue of their dependence and by virtue of the features recited therein.

Dependent claims 3 and 9

In addition to the foregoing, Applicant submits that dependent claims 3 and 9 are additionally allowable at least for the following reasons. In particular, Applicant submits that the Examiner has not properly considered the previous arguments regarding the failure of Shaw to suggest the features of claims 3 and 9, which respectively defines the plurality of metal pieces as having different thicknesses. In this regard, Applicant has noted that Shaw merely teaches that “multi-component golf *iron* heads” each having one of more face-piece components of low friction and flexural modulus characteristics “minimize spin and maximize distance and

straightness.” *See* Amendment of February 6, 2006 at pages 21-23 and Shaw at col. 2, lines 39-43.

However, Shaw refers to the thickness of the face component merely in reference to the specific gravity of face components for *different irons*. Specifically, Applicant notes that Shaw teaches that a “low specific gravity face piece component having a thickness which increases in the toe to heel direction provides main body mass for distribution in the toe of the head, and conversely, such a face-piece having a thickness which increases in the heel to toe direction provides main body mass for distribution in the heel of the head.” *See* Shaw at col. 3, lines 54-60. Thus, Shaw teaches that “the center of gravity can be located nearer the toe for the long irons and progressively nearer the heel for the short irons.” *See* Shaw at col. 3, lines 60-63.

Therefore, contrary to the Examiner’s assertion, Shaw does not teach that varying the thickness of different metal pieces of a striking face member for a golf club head provides proper weight distribution. Rather, Shaw is simply teaching that different clubs (i.e., long irons and short irons) can have a face piece with a thickness selected for a desired weight distribution.

Therefore, Applicant submits that the Examiner is misinterpreting the actual teaching of Shaw and the rejection of claims 3 and 9 is improper at least because Shaw fails to teach that the metal pieces of a face plate have different thicknesses and the asserted motivation to combine the teaching of Shaw and Kosugi is improper.

RESPONSE UNDER 37 C.F.R. § 1.111
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Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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CUSTOMER NUMBER

Date: September 26, 2006